

DRAWINGS ATTACHED.

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Int. Cl.:—B 26 d.

COMPLETE SPECIFICATION.

Cutting Device.

We, THOMAS C. KEAY LIMITED, a British Company, of Baltic Street, Dundee, Angus, Scotland, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The subject of this invention is a cutting device particularly adapted for use in conjunction with a sewing machine adapted to fasten strip or tape material to a series of objects, the cutting device being particularly suitable for cutting the strip or tape material between one object and another after the strip or tape has been applied to the objects. The machine is specially adapted for use with a machine for making paper bags in which a length of strip material is fastened across the bottom of each bag in turn as it passes through the machine.

A cutting device according to the invention includes a cutting disc presenting arms projecting outwardly from the centre, each arm presenting two parallel cutting edges constituted by the lines where the leading face and the opposite side faces of the arm meet, two floating ledger blades so located one on each side of the disc that the arms pass between the ledger blades as the disc rotates, spring means urging the ledger blades into contact with the respective side faces of the arms which meet the leading faces of the arms to form the cutting edges, and means for imparting intermittent unidirectional rotation to the disc.

The arms may be integral with the disc or may be fitted separately to the disc so that any arm may be detached for repair

or replacement, for example, without disturbing the other arms.

The configuration of the arms may be such that the leading face of each arm may lie in a tangent plane to an imaginary cylinder coaxial with the disc. Alternatively, the leading face of each arm may be in a plane containing the axis of the disc.

The leading faces of the arms and/or the side faces may be hollow ground to reduce the thicknesses of the cutting edges and thus increase their keenness.

The means for imparting intermittent uni-directional rotation to the disc may consist of a solenoid, or a cylinder and piston assembly adapted to receive operating fluid which may be air or oil, and a one way clutch device coupled to the disc. The one way clutch device may incorporate a pawl and ratchet wheel, or may be of the friction type.

The means for imparting intermittent rotation to the disc may be adapted to be controlled by a feeler device which is actuated when the object being sewn is in the appropriate position for the cutting device to operate to cut the tape or strip.

Preferably the disc is also connected to a ratchet wheel co-operating with a detent adapted to prevent reverse rotation of the disc, and there may also be provided a ratchet wheel co-operating with a detent to limit the angle of forward rotation of the disc, said last-mentioned detent being coupled to the means for providing intermittent rotation of the disc so that the detent is withdrawn from the ratchet wheel while the disc is being rotated and is released just before the point at which the disc is to come to rest so that the engage-

[Price 4s. 6d.]

ment of said detent with the appropriate tooth on the ratchet wheel will cause the disc to come to rest after the desired amount of angular rotation.

5 In an alternative construction the cutting disc or a separate disc mounted on the same shaft as the cutting disc presents a series of depressions engageable by a spring-loaded ball, the ball entering each
10 depression to stop the disc at the appropriate position of each arm relative to the ledger blades.

A practical embodiment of a device is illustrated in the accompanying drawings
15 in which:—

Fig. 1 is a view looking on one side of the device;

Fig. 2 is a view looking on the opposite side;

20 Fig. 3 is a part view looking in the direction of the arrow A in Fig. 1; and

Fig. 4 is a view looking in the direction of the arrow B in Fig. 1.

In the drawings, 1 denotes a cutting disc presenting arms 2 each of which has a leading face 3 presented by the thickness of the arm. 4 denotes cutting edges formed where the leading faces 3 and the side faces of the arms meet and 5 denotes floating ledger blades urged by a spring 6 to move towards one another and consequently to come into contact with the side faces of the arms 2 as the arms 2 pass between the ledger blades 5. 7 denotes a one way clutch device one element of which is connected to a shaft 8 which carries the cutting disc 1 and the other element of which is connected to an operating rod 9 coupled to means for producing reciprocating motion. Such means may be a solenoid or a cylinder and piston assembly adapted to receive operating fluid. The element of the one way clutch device 7 connected to the operating rod 9 carries a cam lobe 10 with which is associated a cam follower 11 mounted on one end of an arm 12 fixed to a swing shaft 13 which also carries a detent 14 engageable with a ratchet wheel 15 fixed to the shaft 8.
50 The ratchet wheel 15 is formed with the same number of teeth as there are arms on the disc 1 and the detent 14 is urged by a spring 16 into engagement with the ratchet wheel 15. 17 denotes a frame supporting the shaft 8, the swing shaft 13 and the ledger blades 5.

In practice, as the sewing operation on each object is completed, the object actuates the feeler device, and the rod 9 is reciprocated to cause the disc 1 to describe the desired amount of partial rotation. The tape or strip on its way from the sewing machine passes across the ledger blades 5 and as each arm 2 comes between the
65 ledger blades 5 the tape or strip is cut

simultaneously at two places thus removing a narrow transverse strip from the tape or strip. Continued rotation of the disc 1 after the cutting operation has been completed leaves a space between the ledger blades 5 and the next following arm 2 for passage of the next portion of the tape or strip sewn to the next following object. During each stroke of the rod 9 to cause the disc 1 to swing, the cam lobe 10 engages the cam follower 11 and causes the arm 12 to swing and with it the swing shaft 13 and the detent 14, which latter is moved out of engagement with the ratchet wheel 15 thus permitting the shaft 8 carrying the disc 1 to perform a rotational movement. Immediately before the next rest position of the disc 1 the cam lobe 10 moves out of engagement with the follower 11 and the spring 16 moves the detent 14 into engagement with the ratchet wheel 15, the appropriate tooth on the ratchet wheel then arresting the disc in the desired position. The uni-directional rotation of the cutting disc 1 provides that each cutting arm 2 moves in one direction only and consequently after each cutting action is performed there is no step of withdrawing the cutting blade to permit passage of the cut end of the strip for the next sewing operation. In previously known cutting devices having a reciprocating blade the necessity for reversing the direction of movement of the moving blade to withdraw the moving blade from the ledger blade is a frequent source of trouble in that the moving blade as it is being withdrawn obstructs the free passage of the material being cut as well as causing a certain loss of time in the operation of the device.

The cutting disc does not require to be located precisely in an axial direction as each ledger blade will move under the influence of the spring means into contact with the respective cutting edge.

The two parallel and simultaneous cutting actions cause the cutting forces on the strip to be equalised and there is little or no tendency for the strip to bend rather than be cut.

WHAT WE CLAIM IS:—

1. A cutting device including a cutting disc presenting arms projecting outwardly from the centre, each arm presenting two parallel cutting edges constituted by the lines where the leading face and the opposite side faces of the arm meet, two floating ledger blades so located one on each side of the disc that the arms pass between the ledger blades as the disc rotates, spring means urging the ledger blades into contact with the respective side faces of the arms which meet the leading faces of the

- arms to form the cutting edges, and means for imparting intermittent uni-directional rotation to the disc.
- 5 2. A cutting device as claimed in Claim 1 in which the configuration of the arms is such that the leading face of each arm lies in a plane containing the axis of the disc.
- 10 3. A cutting device as claimed in Claim 1 incorporating a ratchet wheel co-operating with a detent to limit the angle of forward motion of the disc, the detent being coupled to the means for providing intermittent rotation of the disc so that
- 15 4. A cutting device as claimed in Claim 3 in which the means for imparting uni-directional rotation to the disc presents a cam lobe engageable with a follower mounted on an arm fixed to a swing shaft, the detent being mounted on the swing shaft.
- 20 5. A cutting device substantially as described with reference to the accompanying drawings.
- 25

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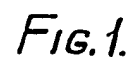


FIG. 1.

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COMPLETE SPECIFICATION

4 SHEETS

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the Original on a reduced scale
Sheets 1 & 2*

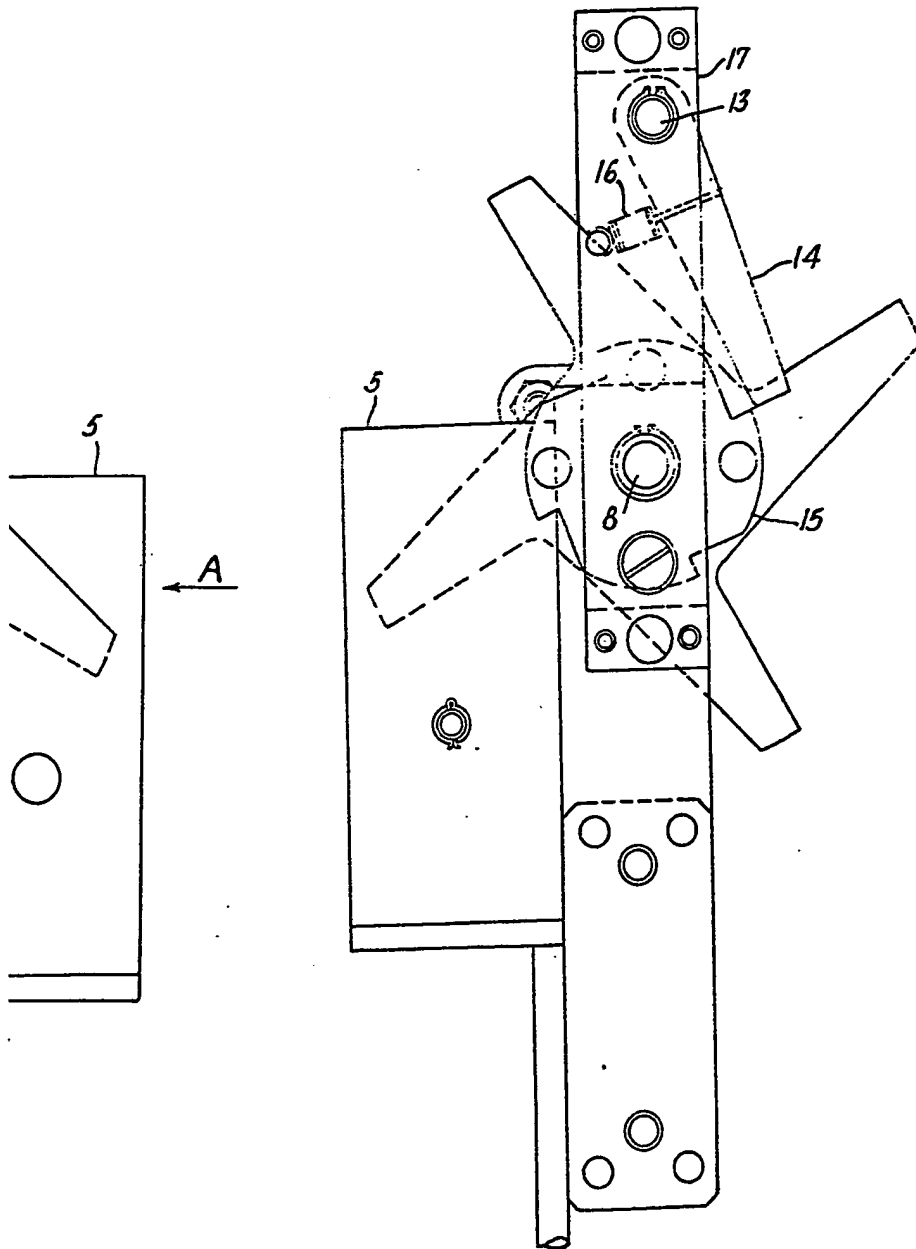
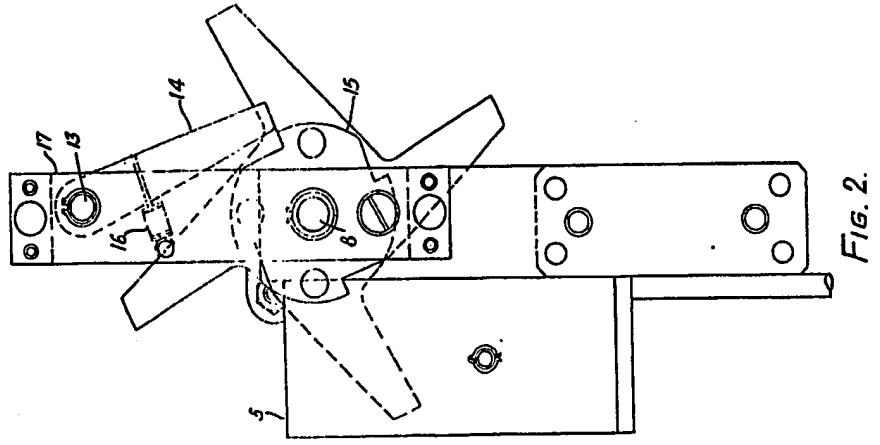
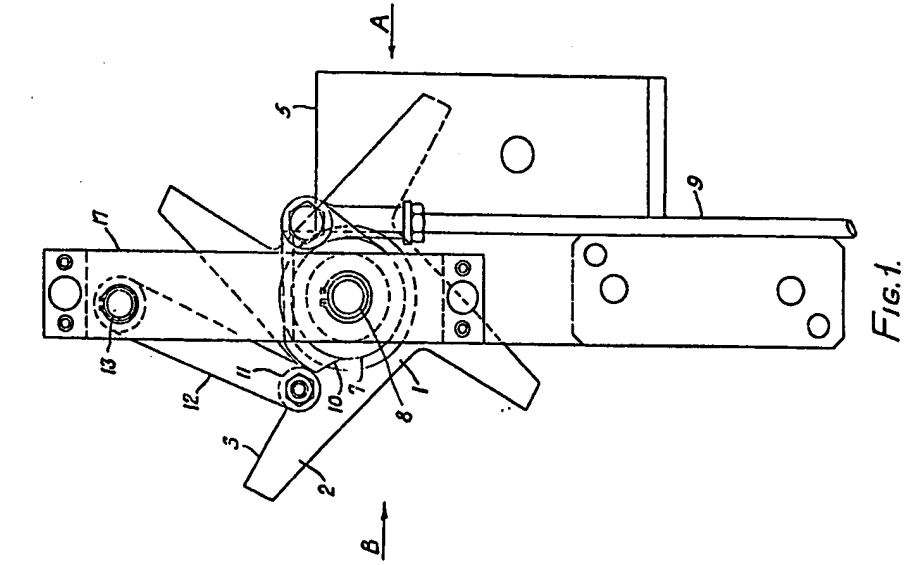


FIG. 2.



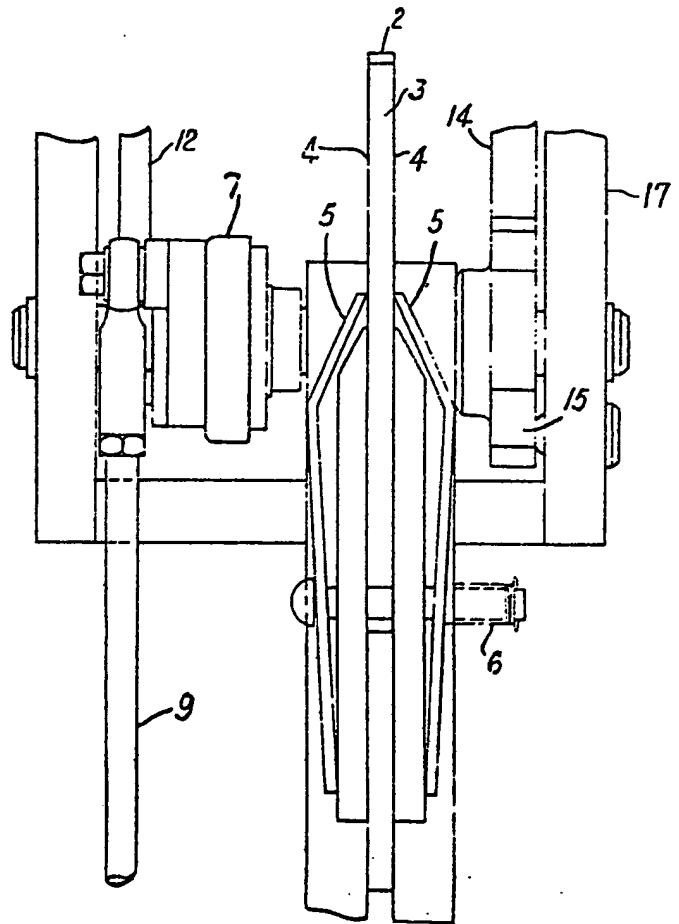


FIG. 3.

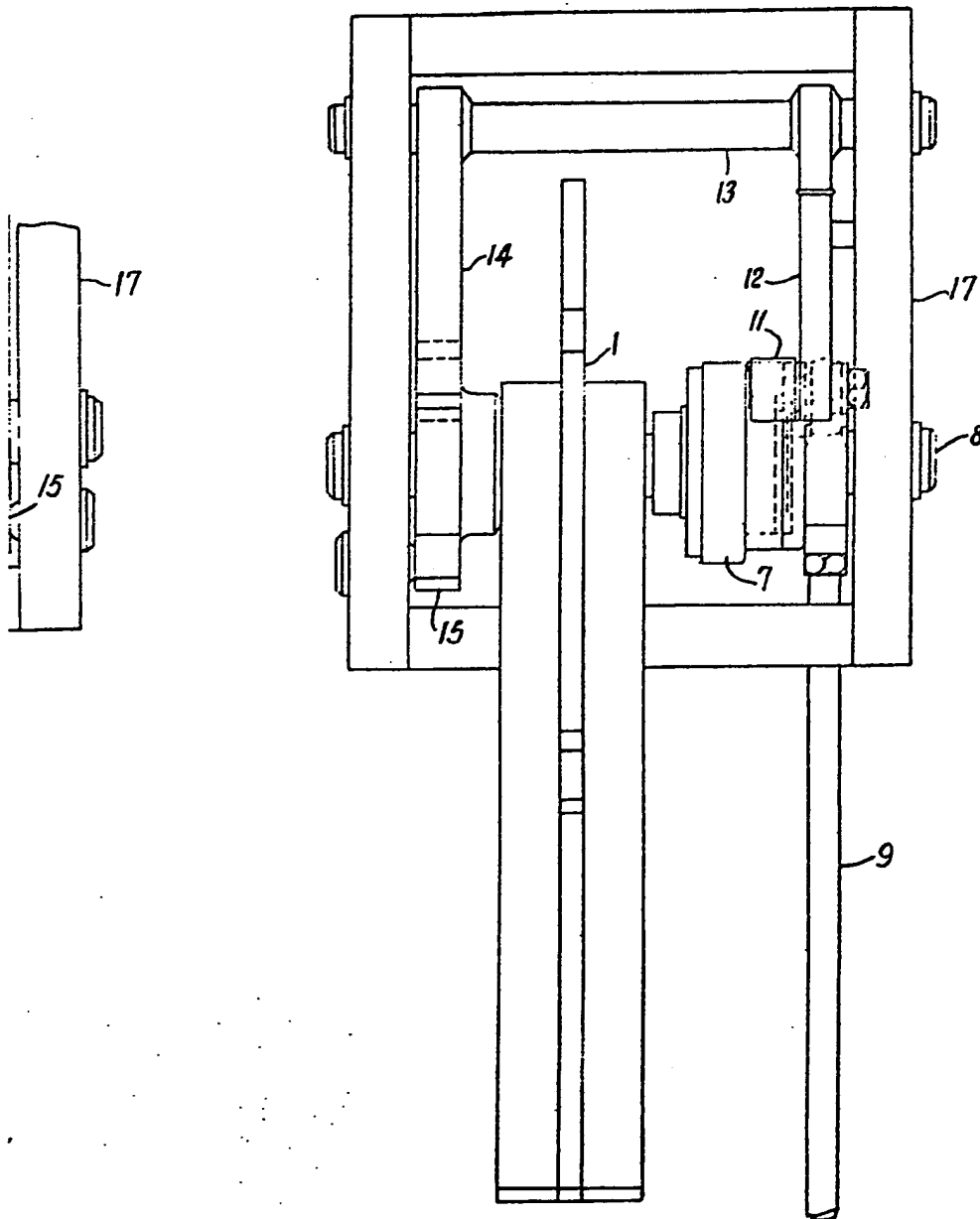
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COMPLETE SPECIFICATION

4 SHEETS

*This drawing is a reproduction of
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Sheets 3 & 4



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4 SHEETS
Sheets 3 & 4

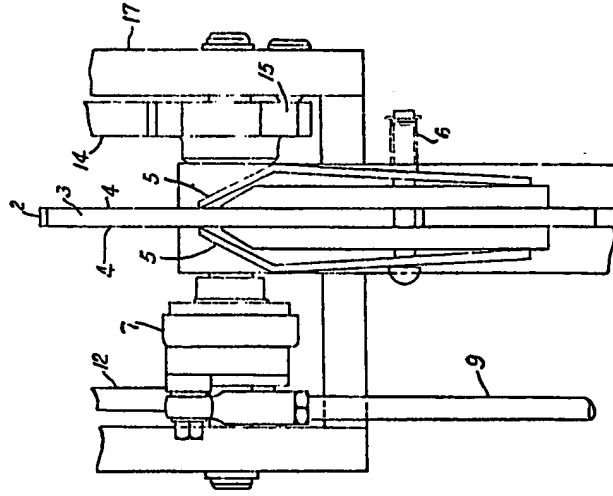


Fig. 3.

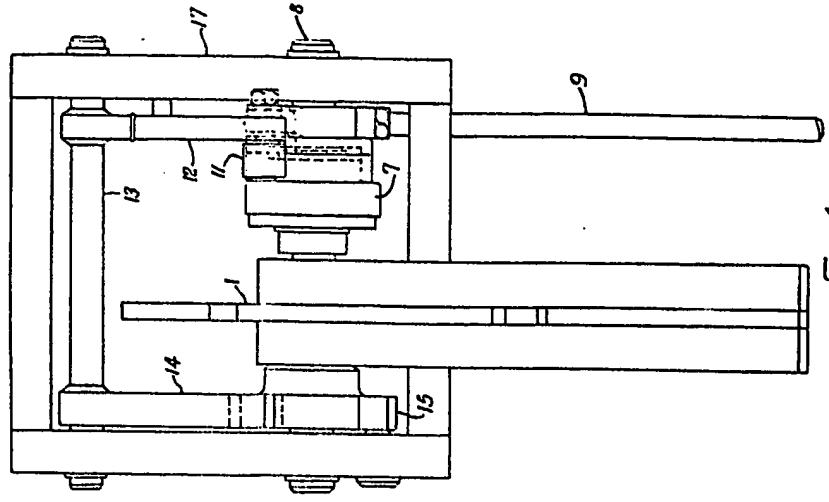


Fig. 4.